

**MANAGING FLOOD WASTE: A BURDEN TO KUALA KRAI RESIDENTS**

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**ABSTRACT**

The purpose of this paper is to identify the perception regarding the post-flood waste management system in Kuala Krai, Kelantan. 24 respondents - 12 men and 12 women - were selected at random using the following criteria: 25 years old and above, local residents from Kuala Krai, Kelantan, and directly involved with the flood in 2014. Respondents were divided into 3 groups each consisting of 8 people. The discussion sessions were held according to the Focus Group Discussion (FGD) format and carried out by an experienced moderator. The study shows that ineffective flood waste management provisions in government policies and individual management are the main causes of the spread of diseases and the longer time before cleaning work took place than before. Besides, the psychological effects of flooding on the villagers such as trauma, depression, and shock were due to the loss of their assets. The issue of cooperation among people also arose in the study as one of the effective factors in flood waste management in Kuala Krai. The study also notes suggestions from the villagers about the upgrading of the methods of flood waste management for the future. This paper can be used as a basis for determining the policies or guidelines that are needed by the government when improving the effectiveness of flood waste management.

**Keywords:** flood, waste management, Kuala Krai, Focus group discussion.

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## INTRODUCTION

A disaster is an occurrence that altering the environment and normal activity of the community that can cause pain and misery to the victims. In Asia, statistics indicate that natural disasters between 1992 and 2002, including flood disasters, have affected a total of 1.7 million people and claimed a total of 420,867 lives. It also involves the loss of property valued at 369,362 million US dollars (Haryati, 2010). The disasters affect people's lives and the country as a whole. The risk of disaster was the big issue which is frequently discussed by all the countries around the world. In the two decades around the Millenium, millions of lives had faced disasters such as flood, earthquake, typhoon and others (World Conference on Disaster Reduction, 2005).

Disasters are brought about by various causes such as earthquakes, tsunamis, typhoons, volcanic eruptions, fire, terrorism, war, and negligence. Over the past decade, several major disasters have destroyed social infrastructure all over the world: the Sumatra–Andaman earthquake in 2004, Hurricane Katrina in 2005, the Great Sichuan Earthquake in 2008, and the earthquakes in New Zealand and Turkey in 2011 and also the massive flooding in Thailand in 2011 (Periathamby *et al.* (2012).

In Malaysia, Kelantan State faced a flood disaster in 2014. Previous history has indicated that floods happens every year in Kelantan, including the worst during year 1927 and 1967. The 1967 flood had a major influences on Kelantan residents. It has been estimated that 70% of the places in Kelantan, or nearly half of the state's population, were affected (Chan, 1995). Meanwhile, the 2014 flood in December was the largest recorded flood in the history of Kelantan. It was considered to be a disaster like tsunami where more than 100,000 residents were evacuated. (The Star, 2014).

All of these disasters caused waste problems. The types of waste were categorized based on the disaster's causes, the types of industry in the locality, the density of buildings, and other such factors. Some aspects or strategies could be emphasized by the persons involved in disposal of the waste. They include the availability of disposal capacity, availability of treatment, recycling and reuse options, transportation of waste materials, accessibility to waste management facilities, environmental hazards, financial implications, labor availability, and legal and ethical responsibilities (Periathamby, A. *et al.* (2012). Besides, there are some aspects of disaster waste treatment applied by some countries. They dispose of the waste by creating temporary staging sites, recycling, turning waste into energy, open burning, land reclamation and engineering fill and disposal of the waste. For example, people can apply the

recycling concept to the waste because some parts can actually be recycled so that valuable resources can be reused and scarce landfill space conserved (Brown, C. *et al.* (2011).

The present study investigates the effectiveness of post-flood waste management. The objectives of the study are to consider:

- i. The level of severity of floods and their effects,
- ii. The effectiveness of flood waste management,
- iii. The failure factors of flood waste management,
- iv. The spreading of diseases after the flood.

## **METHODOLOGY**

**Research Subjects:** A total of 24 respondents consisting of 12 men and 12 women were selected at random. Among the criteria taken into consideration during the selection of respondents were: 25 years old and above, local residents, and directly involved with the flood in 2014. Respondents were selected from the area hit by the flood disaster, namely Kuala Krai. Respondents were divided into 3 groups with 8 people in each group. Respondents were selected from those who experienced the flood year 2014 and who were in the flooded area. Adults who have mental problems or depression were not selected.

**Settings:** Kuala Krai, Kelantan

**Procedures:** The study used a cross-sectional research design involving focus group discussion (FGD). The discussion sessions were held according to the Focus Group Discussion format (FGD) and carried out by an experienced moderator from the Ministry of Health Malaysia. All respondents were briefed concerning the study and the purpose of the research. Respondents were informed that all the information from the discussion would be recorded for the purposes of the study, and would not be made public. A written consent form was completed by each respondent. Questions asked to the subjects have been confirmed by an expert group.

**Data Collection:** The FGD interview was recorded using an audio recorder and later transcribed. The transcription was then categorized into themes.

## **RESULTS AND DISCUSSION**

Table 1 shows that a majority of the participants were male (52.0%) and the rest were female (48.0%). The religion of all the respondents was Islam (100%) and they were also all Malay (100%). The marital status fell into three groups: single (0%), married (76.0%) and divorced/single parent (24%). Then, six types of job were identified: housewife (44%), self-

employment (12%), labor (4%), private employee (8%), government employee (20%) and non-working (12%). All the respondents came from the same village, Kuala Krai, and they had experienced the flood disaster year of 2014.

The results in Table 3 showed that the severity of the flood situation has occurred in Kuala Krai and brought hardship to the people. Most of the residences required more time to clean the flood mud.

**Table 1.** Demographic percentage

Criteria	Percentage
<b>Gender</b>	
Men	52.0%
Women	48.0%
<b>Race</b>	
Malay	100%
<b>Marital status</b>	
Bachelor	0%
Married	76%
Divorced/Single parent	24%
<b>Occupation</b>	
Labor	4%
Private employee	8%
Government employee	20%
Housewife	44%
Self-employment	12%
Non-working	
<b>Duration Stay in Kuala Krai</b>	
0-9 years	8%
10-39 years	16%
40-69 years	68%
70-99 years	8%

As in Table 2, the villagers have experience of flooding in the year 2014. Trauma, loss of property, health problems are some of the effects experienced by the residents

**Table 2.** The effect of the flood

Theme	Sub-theme
Effect of flood	Trauma
	(R2, FGD3, male, Kuala Krai, 49 years old): <i>(Flood outstanding. Still traumatized because the flood came suddenly. Unexpected)</i>
	(R5, FGD3, female, Kuala Krai, 45 years old): <i>High trauma when I saw the water. (When people tell me about the flood I quickly want to keep the goods. Trauma was still high. I still feel the trauma.)</i>
	(R7, FGD3, female, Kuala Krai, 50 years old): <i>(I am still traumatized. Because the house damaged. So now I live in the transit house)</i>
	<b>Loss of property</b>
	(R4, FGD3, male, Kuala Krai, 45 years old): <i>(All things in the house damaged. All the furniture cannot be saved. Many losses, estimated losses around 40 thousand.)</i>
	(R1, FGD1, male, Kuala Krai, 63 years old): <i>(I lost my house.</i>

*Estimated losses around 100 thousand.)*

(R1, FGD1, male, Kuala Krai, 63 years old): *(Properties damaged such as Refrigerator, washing machine, electrical items, furniture.)*

**Diseases**

(R8, FGD1, male, Kuala Krai, 69 years old): *(I affected by allergic in flood.)*

(R7, FGD1, male, Kuala Krai, 62 years old): *(I was affected by skin diseases.)*

(R6, FGD3, female, Kuala Krai, 46 years old): *(I [was] affected body itch, skin diseases.)*

**Table 3.** Severity of flood

Theme	Sub-theme
Severity of flood	High of water level (R8, FGD3, female, Kuala Krai, 48 years old): (When the water level rises in the morning I was in the railways. I see the water rising so quickly and so fast.)
	(R1, FGD3, male, Kuala Krai, 45 years old): (Flood waters in the past did not get to the school area. during my life I have never seen such a big flood water. This is the worst of all.)
	(R3, FGD2, female, Kuala Krai, 54 years old): (2 weeks submerged by flood water. Our place like the island.)
	Mud (R2, FGD2, female, Kuala Krai, 49 years old): (Too much mud. smelly. I had to clean up the mud.)
	(R5, FGD1, male, Kuala Krai, 70 years old): (NGOs help clean the mud. Mud is very thick. Thickness of around 1 <i>feet</i> = 12 inches.)
	(R8, FGD3, female, Kuala Krai, 48 years old): (After the flood

waters have receded up to the knees. mud on the knees.)

Meanwhile, Table 4 indicates that the ineffectiveness of waste management led to the spread of diseases. The disease came from impurities in the water, dust and the environment. They cause dengue fever, skin diseases, fever, sore throat, diarrhea, and so on. Regarding the treatment, the majority of the respondents received treatment at government and private hospitals. In terms of prevention, the residents believes that taking precautionary measures such as having a supply of clean food and drink, wearing a face mask to avoid dust and washing the items with clean water are a good prevention after the flood.

**Table 4.** Spread of disease

Theme	Sub-theme
Spread of disease	<b>Perception of illness</b>
	(R1, FGDL2, female, Kuala Krai, 43 years old): (Skin disease happened after the flood. We cannot eat because of a sore throat.)
	(R7, FGDL1, male, Kuala Krai, 62 years old): (Normally, we face the skin disease.)
	(R7, FGDL1, male, Kuala Krai, 62 years old): (Normally, we face the diarrhea.)
	<b>Perception of treatment</b>
	(R5 & R6, FGDL1, male, Kuala Krai, 70 & 58 years old): (We get the treatment at the Hospital Kuala Krai.)
	(R1, FGDL2, female, Kuala Krai, 43 years old): (Doctor from Taiwan gives for the



treatment from house to house to check the diseases, and provide remedies for the diseases.)

(R2, FGDL1, male, Kuala Krai, 52 years old): (We went to private clinic for treatment.)

#### **Perception of Prevention**

(R2, FGDL2, female, Kuala Krai, 49 years old): (We wash the utensils like glass before eating, to avoid the germs.)

(R6, FGDL3, female, Kuala Krai, 46 years old): (Not allowed our children get out from the house.)

(R6, FGDL3, female, Kuala Krai, 46 years old): (We wear a mask outside the house.)

## **DISCUSSIONS**

The study found that the flood year 2014 was the worst flood to strike Kelantan due to 90% of the areas in Kelantan experiencing the flood. The severity of the flood described by residents Kuala Krai was based on the damage to property, the spread of diseases, the height of the water level and the thick mud. People lost property and assets, like their house, which were too valuable for them to survive. According to the World Conference on Disaster Reduction (2005), the effect of flood was most on losses of the property, and this will really affect those who have lower income as they need to start again their livelihood such as bare the cost to build houses. Almost all the residents lost their home and most of the valuable items could not be saved. Examples of property losses are houses, cars, electrical goods, important documents, clothes and so on. This situation led people to become depressed. The majority of the losses are in hundreds of thousands of ringgits. These are very large losses due to floods.

The other effect of flooding was the psychological aspect, which is trauma. Trauma still haunts the residents although the flood happened almost 1 year previously, in 2014. This is because the flood of 2014 is considered the worst in the history of Kelantan and residents had never experienced a major flood like that before. They claimed that typically floods will occur at the end of each year in the month of December, and previous floods did not lead to the major destruction. For them, they did not expect such a big flood to happen to them. That is why and they did not make any preparations for it.

The waste, especially the mud carried by the flood, became the main problem to the residents in the clear-up process. Mud left its mark on the walls of the house, furniture, home appliances, and clothing. The respondents agree that the dried thick mud became the main problem in the cleaning process. This is because floods in the past did not leave the thick mud. The same problem happened in Costa Rica in 1963 (Carlos, A., 1966). This condition was also considered as unusual compared with floods that had hit the country over the years.

The study also found the according to the perception of residents, the lacking in waste management is due to miscommunication with local authorities. There were weaknesses in the existing system such as no guidelines (SOPs) specifically for flood management. Weakness in early planning by the local authorities makes people more desperate, especially during and after the flood. They claimed that the local authorities did not act according to its policies. The slow in action by authorities due to the difficulties to enter affected areas, causing slow action was taken to assist the people affected by the flood. Besides, there was not enough facilities such as waste truck and officers to monitor the place during flooding. Based on the view of people, the facilities were overwhelmed in the flood and the local authorities have only a few assets to assist residences. Due to the lack of systematic planning, the situation of people became chaotic. Residences claim that the local authorities give and try to give sufficient willingness to help, besides that's NGOs also struggle to help people in many situations such as cleaning the waste, giving medical treatment, distribution of food and others. The local authorities also had problems to get cooperation from other districts when the flood occurred. It is due to the fact that other district also facing the same problems which is handling too much flood waste.

There were no health education activities as a preparation to face a flood as recommended in Markenson (2005). No educational activities such as workshops, awareness campaigns on waste management or disaster simulation for if a flood, took place. Respondents also did not get clear information or exposure related to the flood or health activities by the local authorities before, during or after the flood. According to the respondents' statements, it

shows that lack of help from local authorities during the flood because the authorities also face the disasters and were unable to come to the residents' location.

Ineffectiveness of waste management led to the spread of diseases. The disease came from impurities in the water, dust and the environment and caused dengue fever, skin diseases, fever, sore throats, diarrhea and leptospirosis. Besides, regarding the treatment, the majority of respondents received treatment at government and private hospitals. But most of them agree that NGOs were concerned and came to the village and gave free treatment. In terms of prevention, the residents believe that taking precautionary measures such as being cautious in taking food and drink, wearing a face mask to avoid dust and washing items with clean water are good precautions after a flood. These show that there is a cautious attitude among people and their ideas about preventive actions after the flood in order to avoid serious illness.

In addition, people in Kuala Krai have some suggestions for improvement, especially if called upon to face the same disaster management situation in future. Transportation upgrading is one of the suggestions. Residents admit that there is a lack of facilities or transportation equipment such as trucks, lorries, and boats. Only one garbage truck is provided in Kuala Krai and it is not enough to handle the waste. Thus, people suggest that the local authorities should add more or upgrade the transportation to avoid the waste being neglected for too long. The local authorities should add more transport in order to make the waste clearance faster and thus prevent the spread of diseases. Transportation upgrading is needed to deal with the flood waste in future.

The other suggestion from the residents is in terms of an Intervention Program. They suggest the improvement in the policy about the flood waste management such as creating a back-up plan in case the major planning cannot be applied in the flood situation. Thus, the situation in the flood would become under control. For example, people suggest the state government should discuss with all district authorities such as Majlis Daerah to obtain assistance for each other when one of the districts faces a disaster. This opinion suggests that the local authorities should play a major role by establishing a program to respond to flooding.

## **CONCLUSIONS**

In conclusion, the flood in 2014 was the most terrifying have occurred in Kelantan. The effect of the flood created problems for the people because large amounts of waste arose and people had to fully clear their own places. To solve the problem, all people including individuals, NGOs and the local authorities have to take fast action the next time a flood happens and they have to implement their policies in order to help residences.

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